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Testing Support for Evaluation of Inspection/Maintenance Issues (Test Group No. 1)

Hamilton Test Systems, Inc.
Phoenix, AZ

Prepared for

Environmental Protection Agency
Ann Arbor, MI

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Fifty-one (51) privately owned in-use vehicles equipped with three-way catalyst emission control systems were recruited and tested. The tests conducted on each of these vehicles included on Idle Test at a DEQ test station, followed by an Idle Test, FTP, HFET, F3M, and a Two Mode Test at the HTS facility. A diagnostic check was performed on each vehicle prior to being pre-conditioned for the FTP. Any vehicle which was equipped with an air pump was also subjected to a repeat of the HTS Idle Test and the Two Mode Test with the air pump disconnected. Restorative maintenance was performed on any vehicle which failed to meet EPA-specified emission criteria.

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TESTING SUPPORT FOR EVALUATION OF INSPECTION, MAINTENANCE ISSUES

(TEST GROUP NO. 1)

REPRODUCED BY
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TESTING SUPPORT FOR EVALUATION OF INSPECTION/MAINTENANCE ISSUES

(TEST GROUP NO. 1)

by

Hamilton Test Systems, Incorporated
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Phoenix, Arizona 85016

Contract No. 68-03-2829
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Prepared for

U. S. ENVIRONMENTAL PROTECTION AGENCY
Office of Mobile Source Air Pollution Control
Emission Control Technology Division
Ann Arbor, Michigan 48105

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	
2.0	SUMMARY	
3.0	PROGRAM OBJECTIVE	
4.0	PROGRAM DESIGN	
4.1	FACILITIES AND EQUIPMENT	
4.1.1	State Inspection Station Facility	
4.1.2	HTS Facility	
4.1.3	Constant Volume Sampler (CVS)	
4.1.4	Dynamometer	
4.1.5	Exhaust Gas Analysis Console	
4.1.6	Computer System	
4.1.7	Miscellaneous Equipment	
4.2	EQUIPMENT QUALIFICATION AND CALIBRATION	
4.2.1	Constant Volume Sampler (CVS)	
4.2.2	Analytical Instrumentation	
4.2.3	Dynamometer	
4.2.4	Garage Analyzer Checks	
4.2.5	Equipment Logs	
4.3	TEST PROCEDURES	
4.3.1	Idle Inspection Test	
4.3.2	Diagnostic Check	
4.3.3	Vehicle FTP Preparation	
4.3.4	Federal Test Procedure (FTP)	
4.3.5	Federal Three-Mode Test	
4.3.6	Highway Fuel Economy Test (HFET)	
4.3.7	Two-Mode Test	
4.4	DATA HANDLING AND QUALITY CONTROL	
4.4.1	Manual Data Handling	
4.4.2	Emissions Data Handling	
4.4.3	Mass Emissions and Fuel Economy Calculations	
5.0	TEST GROUP DIRECTIONS	5-1
5.1	TEST GROUP NO. 1 - THREE WAY CATALYST VEHICLE TESTS	5-2

5.1.1	Summary	5-2
5.1.2	Vehicle Selection	5-3
5.1.3	Recruitment	5-3
5.1.4	Procedures	5-6
5.1.5	Test Results	5-8

APPENDICES

APPENDIX A - Test Group No. 1 Initial Test Results

LIST OF TABLES

Table Number	Title	Page
5.1-1	Vehicle Identification Information & AHP Settings	5-5
5.1-2	EPA NO. 84204 Test Results	5-10
5.1-3	EPA NO. 84707 Test Results	5-13
5.1-4	EPA NO. 94703 Test Results	5-16
5.1-5	EPA NO. 94706 Test Results	5-19
5.1-6	EPA NO. 95206 Test Results	5-23
5.1-7	EPA NO. 95209 Test Results	5-27
5.1-8	EPA NO. 95213 Test Results	5-31
5.1-9	EPA NO. 95214 Test Results	5-34
5.1-10	EPA NO. 95201 Test Results	5-37
5.1-11	EPA NO. 95212 Test Results	5-39

TEST GROUP NO. 1 REPORT

5.0 TEST GROUP DIRECTIONS

The various test group directions contained in this report are as follows:

Test Group No. 1 - Three Way Catalyst Vehicle Tests
Test Group No. 2 - Element II Continuation Tests
Test Group No. 3 - Element III 6 and 12 Month Retests
Test Group No. 4 - Element III 9 Month Retest
Test Group No. 5 - Effectiveness of EGR Repairs
Test Group No. 6 - Heated Air Intake Disablement Tests
Test Group No. 7 - Mechanics Training Evaluation Program

5.1 TEST GROUP NO. 1 - THREE WAY CATALYST VEHICLE TESTS

5.1.1 SUMMARY

Fifty-one (51) privately owned in-use vehicles equipped with three-way catalyst emission control systems were recruited and tested. The tests conducted on each of these vehicles included an Idle Test at a DEQ test station, followed by an Idle Test, FTP, HFET, F3M, and a Two Mode Test at the HTS facility. A diagnostic check was performed on each vehicle prior to being pre-conditioned for the FTP. Any vehicle which was equipped with an air pump was also subjected to a repeat of the HTS Idle Test and the Two Mode Test with the air pump disconnected.

Restorative maintenance was performed on any vehicle which failed to meet EPA-specified emission criteria. Failures were based on the following maximum limits:

- Idle Test (DEQ and/or HTS)
  CO - 1.0%
  HC - 200 ppm (Hexane)

- Two Mode Test
  CO - 1.0%
  HC - 200 ppm (Hexane)

- Federal Test Procedure (FTP)
  CO - 15.0 gpm
  HC - 1.5 gpm
  NO_x - 2.0 gpm (corrected for humidity)

Eight (8) vehicles failed one or more of the above criteria and were subjected to restorative maintenance. All but one, a 1979 Mercury Marquis, were ultimately restored to a pass condition. The failure mode for the Mercury was NO_x and after extensive effort to restore the vehicle, NO_x was reduced from 3.66 to 2.61 grams per mile.

5.1.2 VEHICLE SELECTION

A computer tape (May 1979) of the Oregon Motor Vehicles Division registration information for the model years 1978 and 1979 was provided by EPA. From this tape utilizing the make and vehicle identification number (VIN) codes, a search was made to determine the availability of vehicles equipped with three-way catalyst systems in the Portland Metropolitan Service District (MSD). The availability of the desired vehicles was as follows:

YR/MAKE/MODEL	QUANTITY AVAILABLE
1978 Saab 99	210
1979 Saab 900	47
1978 Volvo 240	705
1979 Volvo 240	402
1978 Volvo 260	175
1979 Volvo 260	58
1979 Mercury Marquis	42
1979 Pontiac Sunbird*	1

5.1.3 VEHICLE RECRUITMENT

The requirement for recruitment for this test group was to procure as many 1979 Mercury Marquises as possible and then recruit a sampling of other vehicles with three-way catalyst emission control systems to yield a total for the test group of approximately fifty vehicles.

The incentives for recruitment included a $50.00 U.S. Savings Bond, the use of a late model loan car, and a full tank of gas upon return of the participant's vehicle.

The final make-up of the vehicles selected was as follows:

YR/MAKE/MODEL	QUANTITY
1979 Mercury Marquis	15
1978 Saab 99	6
1979 Saab 900	3
1978 Volvo 240	7
1979 Volvo 240	8
1978 Volvo 260	6
1979 Volvo 260	5
1978 Pontiac Sunbird	1
TOTAL	51

* The Sunbird was the only General Motors vehicle in the Portland area which had either a 151 or 231 cubic inch engine and a California engine code.

5.1.3 (Continued)

The vehicle identification information for each of the selected vehicles is shown on Table 5.1-1. The legend for the table is as follows:

MKE - Make Code
MDL - Model Code
ENG FAM - Engine Family
CID - Cubic Inch Displacement
C - No. of Cylinders
WT - Inertia Weight
T - Transmission Code (1 = Manual, 2 = Auto)
E - Electronic Ignition (1 = Yes, 2 = No)
A - Air Conditioning (1 = Yes, 2 = No)
LC - Lead Content of Fuel (1/100 grams per gallon)
AHP - Actual Horsepower
3 M-H - Three-Mode Test (52 MPH)
3 M-L - Three-Mode Test (25 MPH)

Make Codes	Model Codes
033 - Mercury	391 - Marquis
045 - Pontiac	403 - Sunbird
600 - Volvo	600 - 240
625 - Saab	602 - 260
	625 - 99
	626 - 900

The first three digits of the EPA NO. represent the "cell" number. The cell number is used to identify similar vehicles with the same year, make and engine family. The first digit is the model year of the vehicle.

TABLE 5.1-1 VEHICLE IDENTIFICATION INFORMATION & AHP SETTINGS

EPA NO	VEH IDENT NO	MKE	MDL	ENG FAM	CID	C	WT	T	E	A	LC	-AHP SETTINGS- FTP	3M-H	3M-L
82701	2M2718U534879	045	403	820X6EU	151	4	3000	2	1	2	2	9.5	13.0	6.5
84201	99782003970	625	625	BI20CA	121	4	3000	1	2	2	8	10.5	13.5	6.5
84202	99781018391	625	625	BI20CA	121	4	3000	2	2	2	9	10.5	13.5	6.5
84203	99781021708	625	625	BI20CA	121	4	3000	2	2	2	4	10.5	13.5	6.5
84204	99781019805	625	625	BI20CA	121	4	3000	1	2	2	5	10.5	13.5	6.5
84205	99781009846	625	625	BI20CA	121	4	3000	1	2	1	4	11.6	16.0	6.5
84206	99782007269	625	625	BI20CA	121	4	3000	1	2	2	10	10.5	13.5	6.5
84701	24545L1203821	600	600	4CL	130	4	3500	1	2	2	4	12.8	17.5	7.5
84702	24545L1170826	600	600	4CL	130	4	3500	2	2	1	4	12.8	17.5	7.5
84703	24245L1138094	600	600	4CL	130	4	3000	2	2	2	3	12.5	16.0	6.5
84704	24545L11240	600	600	4CL	130	4	3000	1	2	2	3	12.5	16.0	6.5
84705	24445L3125243	600	600	4CL	130	4	3000	2	2	1	4	12.5	16.0	6.5
84706	24245L1132307	600	600	4CL	130	4	3000	1	2	2	4	12.5	16.0	6.5
84707	24545L1209996	600	600	4CL	130	4	3500	2	2	1	4	12.8	17.5	7.5
84801	26565L1012460	600	602	6CL	163	6	3500	1	2	1	4	12.8	17.5	7.5
84802	26565L1013153	600	602	6CL	163	6	3500	2	2	1	5	12.8	17.5	7.5
84803	26465L1057772	600	602	6CL	163	6	3500	2	2	1	4	12.5	16.0	7.5
84804	26265L0003736	600	602	6CL	163	6	3500	1	2	1	4	12.5	16.0	7.5
84805	26565L1014924	600	602	6CL	163	6	3500	1	2	1	5	12.8	17.5	7.5
84806	26465L1056237	600	602	6CL	163	6	3500	2	2	1	8	12.5	16.0	7.5
94201	90791002936	625	626	BI20CA	121	4	3000	1	2	1	5	11.6	16.0	6.5
94202	90791010765	625	626	BI20CA	121	4	3000	1	2	2	6	10.5	13.5	6.5
94203	90791005509	625	626	BI20CA	121	4	3000	1	2	2	4	10.5	13.5	6.5
94701	24545M1220152	600	600	4CL	130	4	3500	1	2	2	4	12.8	17.5	7.5
94702	24245M1143408	600	600	4CL	130	4	3000	2	2	2	4	12.5	16.0	6.5
94703	24245M1142757	600	600	4CL	130	4	3000	1	2	2	6	12.5	16.0	6.5
94704	24445M1377582	600	600	4CL	130	4	3000	2	2	1	4	12.5	16.0	6.5
94705	24545M1216274	600	600	4CL	130	4	3500	1	2	2	4	12.8	17.5	7.5
94706	24445M1369780	600	600	4CL	130	4	3000	1	2	1	2	12.5	16.0	6.5
94707	24545M1218991	600	600	4CL	130	4	3500	1	2	2	3	12.8	17.5	7.5
94708	24245M1144969	600	600	4CL	130	4	3000	2	2	2	3	12.5	16.0	6.5
94801	26465M1068128	600	602	6CL	163	6	3500	2	2	1	5	12.5	16.0	7.5
94802	26465M1071892	600	602	6CL	163	6	3500	2	2	1	4	12.5	16.0	7.5
94803	26465M1069855	600	602	6CL	163	6	3500	2	2	1	5	12.5	16.0	7.5
94804	26465M1068539	600	602	6CL	163	6	3500	1	2	1	7	12.5	16.0	7.5
94805	26465M1070120	600	602	6CL	163	6	3500	2	2	1	8	12.5	16.0	7.5
95201	9Z65H676360	033	391	5.8WBV2T	351	8	4000	2	1	1	5	12.0	17.0	8.5
95202	9Z65H600998	033	391	5.8WBV2T	351	8	4000	2	1	1	3	12.0	17.0	8.5
95203	9Z66H668502	033	391	5.8WBV2T	351	8	4000	2	1	1	3	12.0	17.0	8.5
95204	9Z66H678092	033	391	5.8WBV2T	351	8	4000	2	1	1	4	12.0	17.0	8.5
95205	9Z66H603270	033	391	5.8WBV2T	351	8	4000	2	1	1	3	12.0	17.0	8.5
95206	9Z64H605509	033	391	5.8WBV2T	351	8	4000	2	1	1	2	12.0	17.0	8.5
95207	9Z65H662436	033	391	5.8WBV2T	351	8	4000	2	1	1	5	12.0	17.0	8.5
95208	9Z66H601000	033	391	5.8WBV2T	351	8	4000	2	1	1	2	12.0	17.0	8.5
95209	9Z66H670819	033	391	5.8WBV2T	351	8	4000	2	1	1	5	12.0	17.0	8.5
95210	9Z64H630244	033	391	5.8WBV2T	351	8	4000	2	1	1	4	12.0	17.0	8.5
95211	9Z63H612949	033	391	5.8WBV2T	351	8	4000	2	1	1	3	12.0	17.0	8.5
95212	9Z65H604012	033	391	5.8WBV2T	351	8	4000	2	1	1	4	12.0	17.0	8.5
95213	9Z64H649513	033	391	5.8WBV2T	351	8	4000	2	1	1	3	12.0	17.0	8.5
95214	9Z65H692942	033	391	5.8WBV2T	351	8	4000	2	1	1	4	12.0	17.0	8.5
95215	9Z64H663026	033	391	5.8WBV2T	351	8	4000	2	1	1	3	12.0	17.0	8.5

5.1.4 TEST PROCEDURES

5.1.4.1 Initial Test Sequencing

Upon completion of the owner interview which provided information for the Vehicle Owner Questionnaire, the vehicle was tested per the following sequence:

- Idle Test at the DEQ test station (ref. para. 4.3.1)
- Idle Test at the HTS test facility
- Idle Test with air pump flow diverted
- Diagnostic Inspection (Ref. para. 4.3.2)
- Federal Test Procedure (FTP) (Ref. para. 4.3.3 and 4.3.4)
- Two Mode Test (Ref. para. 4.3.7)
- Two Mode Test with air pump flow diverted
- Federal Three Mode Test (Ref. para. 4.3.5)
- Highway Fuel Economy Test (HFET) (Ref. para. 4.3.6)

The two air pump flow diverted tests were required to be performed only on the Mercury Marquis vehicles.

The results of the DEQ Idle Test, HTS Idle Test, Two Mode Test and the FTP were checked to determine if restorative maintenance was to be performed on the vehicle. The decision was based on whether the vehicle exceeded any of the following limits:

- Idle Test (DEQ and/or HTS)

  CO - 1%

  HC - 200 ppm (Hexane)

  Lower Value of Two Idle Checks

- Two Mode Test

  CO - 1%

  HC - 200 ppm (Hexane)

- Federal Test Procedure (FTP)

  CO - 15.0 grams per mile

  HC - 1.5 grams per mile

  NO_x - 2.0 grams per mile (corrected for humidity)

If a vehicle exceeding the limits for either the two Idle Tests or the Two Mode Test, the test was immediately repeated for confirmation.

5.1.4.2 Restorative Maintenance

Any vehicle which exceeded the limits specified in 5.1.4.1 was subjected to restorative maintenance. The restorative maintenance was performed in accordance with the following steps:

- Correcting Maladjustments and Disablements
- Adjustment of Idle Variables
- Major Tune-up and Replacement of other Defective Pairs

After each step the vehicle was retested per the same sequence of tests (DEQ Idle Test through HFET) as required for the Initial Test. Upon reducing the emissions to levels below the criteria established, the restorative effort was concluded and the vehicle was returned to the owner.

5.1.4.3 Lead Content of Fuel Check

Fuel tank samples were taken on all vehicles as received from the owner. The samples were analyzed for Tetraethyl Lead content.

5.1.4.4 Shift Speeds and Horsepower Setting

All manual transmission vehicles were shifted at 15, 25, and 40 miles per hour.

The actual horsepower settings used for the FTP and the Federal Three Mode Test are shown on Table 5.1-1.

5.1.5 TEST RESULTS

5.1.5.1 Initial Tests

The initial test results are provided in Appendix A for each of the fifty-one (51) vehicles.

5.1.5.2 Restorative Maintenance Tests

Restorative maintenance was performed on eight (8) vehicles which failed the EPA criteria. The findings and test results are detailed in the following paragraphs.

The legends for the test results in the tables referenced are as follows.

SHORT TESTS

CO	-	Carbon Monoxide in Percent
RPM	-	Engine Idle RPM
NOX	-	Oxides of Nitrogen in ppm
1ST	-	Initial Idle Test
2500	-	High Idle Test
2ND	-	Second Idle Test
S	-	Pass/Fail Status (P = Pass, F = Fail)
30 MPH(LAB)	-	30 MPH Test using Laboratory Analyzers
30 MPH(GAR)	-	30 MPH Test using Garage Analyzers
HI(LAB)	-	52 MPH Test using Laboratory Analyzers
HI(GAR)	-	52 MPH Test using Garage Analyzers
LO(LAB)	-	25 MPH Test using Laboratory Analyzers
LO(GAR)	-	25 MPH Test using Garage Analyzers
IDLE(LAB)	-	Idle Test using Laboratory Analyzers
IDLE(GAR)	-	Idle Test using Garage Analyzers
HC	-	Hydrocarbon Emissions in ppm Hexane (GAR); in ppm total hydrocarbons (LAB).

FTP AND HFET TESTS

HC	-	Hydrocarbon Emissions in Grams per Mile
CO	-	Carbon Monoxide Emissions in Grams per Mile
CO2	-	Carbon Dioxide Emissions in Grams per Mile
NOX	-	Oxides of Nitrogen (uncorrected) Emissions in Grams per Mile
NOXC	-	Oxides of Nitrogen Emissions Corrected for Humidity in Grams per Mile
MPG	-	Miles per Gallon Calculated by the Carbon Balance Method

5.1.5.2.1 EPA NO. 84204 - 1978 SAAB

The test results for this vehicle are shown in Table 5.1-2.

Initial Test

Failure Modes:

- DEQ Idle Test - Carbon Monoxide (CO)
- HTS Idle Test - Carbon Monoxide (CO)
- FTP - Carbon Monoxide (CO)

Diagnostic Inspection Problem Areas:

- Idle Speed High
- Idle Mixture Adjustment

Restorative Maintenance

Adjusted Idle Speed and Mixture

1st Retest

Failure Modes:

- DEQ Idle Test - Carbon Monoxide (CO)
- FTP - Carbon Monoxide (CO)

Diagnostic Inspection Problem Areas:

- Oxygen Sensor found defective

2nd Restorative Maintenance

Replaced Oxygen Sensor

2nd Retest

Failure Modes:

- None

Comments

- No driveability problems were noted with this vehicle.
- Inconsistent Idle CO results for the various steady state idle mode tests may have been caused by an intermittent problem with the sensor.
- The replacement of the defective Oxygen Sensor restored the emission levels to standards.

EPA NO. 84204 MAKE/MODEL: Saab/99 ENG: 121-FI TRANS: Manual

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0100	0065	0105	P	02.4	02.4	02.5	F	1300	1300	F
1ST RETEST	0075	0085	0095	P	01.8	03.7	01.7	F	1200	1200	P
2ND RETEST	0010	0010	0010	P	00.0	00.0	00.0	P	1100	1100	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0800	0050	0090	01.8	02.1	02.1	0060	0070	0060	1160	1210
1ST RETEST	0010	0020	0010	00.0	00.0	00.0	0070	0050	0110	1100	1100
2ND RETEST	0020	0100	0010	00.0	00.0	00.0	0060	0050	0060	0830	1100

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0078	0.0	0395	0000	0.0	0032	0.0	0023	0000	0.0
1ST RETEST	0106	0.0	0632	0010	0.0	0023	0.0	0044	0000	0.0
2ND RETEST	0081	0.0	0752	0010	0.0	0026	0.0	0034	0010	0.0

TABLE 5.1-2 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 84204 MAKE/MODEL: Saab 99 ENG: 121-FI TRANS: Manual

TEST	DATE	FTP RESULTS HC	CO	CO_2	NOX	NOXC	MPG	HFET RESULTS HC	CO	CO_2	NOX	MPG
INITIAL	8/3/79	001.14	038.12	0391.2	00.51	00.47	19.5	001.38	064.68	0243.8	00.37	25.35
1ST RETEST	8/6/79	001.15	041.75	0389.8	00.54	00.48	19.3	001.28	057.56	0259.2	00.48	25.07
2ND RETEST	8/8/79	000.15	002.18	0422.8	00.90	00.84	20.8	000.03	000.31	0328.8	00.82	26.92

FEDERAL 3 MODE TEST RESULTS

	HI (LAB) HC	CO	NOX	HI (GAR) HC	CO	LO (LAB) HC	CO	NOX	LO (GAR) HC	CO	IDLE (LAB) HC	CO	NOX	IDLE (GAR) HC	CO
INITIAL	2115	4.7	0147	0120	4.4	2424	4.5	0085	0140	4.2	2608	4.5	0035	0120	4.2
1ST RETEST	1598	3.8	0171	0100	3.8	1769	3.2	0104	0100	3.1	0986	1.2	0032	0050	1.2
2ND RETEST	0065	0.0	1092	0100	0.0	0035	0.0	0134	0010	0.0	0020	0.0	0042	0000	0.0

TABLE 5.1-2 (Sheet 2 of 2)

5.1.5.2.2 EPA NO. 84707 - 1978 VOLVO 240

The test results for this vehicle are shown in Table 5.1-3.

Intitial Test

Failure Modes:

- DEQ Idle Test - Carbon Monoxide (CO)
- HTS Idle Test - Carbon Monoxide (CO)
- Two Mode Test - Carbon Monoxide (CO)
- FTP - Carbon Monoxide (CO)

Diagnostic Inspection Problem Areas:

- Oxygen Sensor Defective

Restorative Maintenance

- Replaced Oxygen Sensor
- Adjusted Idle Speed and Mixture

1st Retest

Failure Modes:

- None

Comments

- No driveability problems were noted with this vehicle.
- The replacement of the defective Oxygen Sensor restored the emission levels to standards.

EPA NO.84707 MAKE/MODEL: Volvo 260 ENG: 130-FI TRANS: Auto

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0115	0045	0120	P	03.1	00.1	03.1	F	1000	1000	P
1ST RETEST	0015	0020	0015	P	00.0	00.2	00.0	P	1050	1050	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0150	0040	0170	03.0	00.0	03.0	0060	0040	0060	0840	0850
1ST RETEST	0010	0010	0010	00.0	00.0	00.0	0050	0060	0050	0090	0090

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0179	0.0	0362	0030	0.0	1268	2.5	0016	0090	2.3
1ST RETEST	0136	0.0	0503	0030	0.0	0090	0.0	0037	0030	0.0

TABLE 5.1-3 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 84707 MAKE/MODEL Volvo 240 ENG: 130-FI TRANS: Auto

		FTP RESULTS						HFET RESULTS				
TEST	DATE	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
INITIAL	7/27/79	000.70	016.82	0445.5	00.93	00.97	18.7	000.05	000.53	0365.9	01.03	24.17
1ST RETEST	8/9/79	000.19	002.01	0468.2	00.95	00.98	18.8	000.04	000.14	0359.2	00.40	24.67

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (GAR)		LO (LAB)			LO (GAR)		IDLE (LAB)			IDLE (GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0133	0.0	0804	0020	0.0	0099	0.0	0128	0020	0.0	1084	2.4	0018	0080	2.5
1ST RETEST	0081	0.0	0808	0020	0.0	0050	0.0	0033	0020	0.0	0047	0.0	0027	0020	0.0

TABLE 5.1-3 (Sheet 2 of 2)

5.1.5.2.3 EPA NO. 94703 - 1979 VOLVO 240

The test results for this vehicle are shown in Table 5.1-4.

Initial Test

Failure Modes:

- DEQ Idle Test - Carbon Monoxide (CO)
- HTS Idle Test - Carbon Monoxide (CO)

Diagnostic Inspection Problem Areas:

- Idle Speed Low

Restorative Maintenance

Adjusted Idle Speed and Mixture

1st Retest

Failure Modes:

- None

Comments

- No driveability problems were noted with this vehicle.
- The initial FTP results show no CO problem.

EPA NO. 94703 MAKE/MODEL: Volvo 240 ENG: 130-FI TRANS: Manual

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0010	0055	0120	P	01.3	00.2	01.6	F	0850	0850	P
1ST RETEST	0010	0015	0015	P	00.0	00.0	00.0	P	1000	1000	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0180	0030	0170	01.5	00.0	01.3	0050	0040	0050	0750	0760
1ST RETEST	0020	0000	0010	00.0	00.0	00.0	0040	0070	0030	0940	0940

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0145	0.0	0269	0010	0.0	0525	0.4	0011	0040	0.4
1ST RETEST	0038	0.0	0214	0010	0.0	0005	0.0	0011	0000	0.0

TABLE 5.1-4 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 94703 MAKE/MODEL Volvo 240 ENG: 130-FI TRANS: Manual

		FTP RESULTS						HFET RESULTS				
TEST	DATE	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
INITIAL	7/19/79	000.38	004.48	0467.2	00.96	01.12	18.7	000.04	000.15	0346.6	01.55	25.56
1ST RETEST	7/27/79	000.21	002.10	0488.8	01.00	00.93	18.0	000.02	000.02	0351.8	01.77	25.20

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (GAR)		LO (LAB)			LO (GAR)		IDLE (LAB)			IDLE (GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0148	0.0	0854	0010	0.0	0084	0.0	0176	0010	0.0	0953	0.8	0011	0080	0.8
1ST RETEST	0044	0.0	0887	0020	0.0	0023	0.0	0018	0010	0.0	0017	0.0	0011	0010	0.0

TABLE 5.1-4 (Sheet 2 of 2)

5.1.5.2.4 EPA NO. 94706 - 1979 VOLVO 240

The test results for this vehicle are shown in Table 5.1-5.

Initial Test

Failure Modes:

- DEQ Idle Test - CO
- HTS Idle Test - HC and CO
- Two Mode Test - HC and CO
- FTP - HC AND CO

Diagnostic Inspection Problem Areas:

- Idle Speed
- Oxygen Sensor Disabled

Restorative Maintenance

Reconnected Oxygen Sensor

1st Retest

Failure Mode:

- None

Diagnostic Inspection Problem Areas

- None

Comments

- No driveability problems were noted with this vehicle.
- Reconnecting the Oxygen Sensor restored the emission levels to standards.

EPA NO. 94706 MAKE/MODEL: Volvo 240 ENG: 130-FI TRANS: Manual

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0095	0120	0105	P	03.2	04.9	02.9	F	0950	0950	P
1ST RETEST	0025	0015	0015	P	00.0	00.0	00.0	P	1050	1050	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0130	0120	0150	01.8	05.2	01.6	0060	0100	0070	0990	0980
1ST RETEST	0010	0030	0020	00.0	00.3	00.1	0020	0050	0030	0890	0890

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	2076	1.7	0039	0130	1.8	2235	2.3	0037	0120	2.3
1ST RETEST	0114	0.0	0333	0020	0.0	0038	0.0	0047	0010	0.0

TABLE 5.1-5 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 94706 MAKE/MODEL Volvo 240 ENG: 130-FI TRANS: Manual

		FTP RESULTS						HFET RESULTS				
TEST	DATE	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
INITIAL	7/20/79	001.73	048.00	0408.5	00.20	00.21	18.1	001.11	031.59	0293.8	00.30	25.56
1ST RETEST	7/23/79	000.23	002.64	0496.6	00.63	00.63	17.7	000.03	000.28	0338.6	01.05	26.15

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (GAR)		LO (LAB)			LO (GAR)		IDLE (LAB)			IDLE (GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	1776	1.3	0120	0120	1.3	1923	1.8	0061	0120	1.7	2069	2.6	0049	0110	2.3
1ST RETEST	0062	0.0	0682	0010	0.0	0038	0.0	0020	0010	0.0	0065	0.0	0013	0010	0.0

TABLE 5.1-5 (Sheet 2 of 2)

5.1.5.2.5 EPA NO 95206 - 1979 MERCURY MARQUIS

The test results for this vehicle are shown in Table 5.1-6.

Initial Test

Failure Modes:

- DEQ Idle Test - HC and CO
- HTS Idle Test - HC and CO
- FTP - HC and CO

Diagnostic Inspection Problem Areas:

- Idle Speed Low
- Fast Idle Speed Low

NOTE

Adequate diagnosis of this vehicle required the use of a Rotunda Electronic Engine Control System Tester. After obtaining the tester a new set of emissions tests were performed to establish a new baseline prior to performing any restorative maintenance.

1st Retest

Failure Modes:

- HTS Idle Test - HC and CO
- Two Mode Test - HC and CO
- FTP - HC, CO and NO_x

Diagnostic Inspection Problem Areas:

Rotunda Tester indicated that the ECA Processor may be the problem.

1st Restorative Maintenance

Vehicle sent to local Mercury dealership for repairs. Unable to obtain feedback as to specific repairs made.

2nd Retest

Failure Modes:

- DEQ Idle Test - HC and CO
- HTS Idle Test - HC and CO
- Two Mode Test - HC and CO
- FTP - HC and CO

Diagnostic Inspection Problem Areas:

- Carburetor Assembly Defective

5.1.5.2.5 (Continued)

2nd Restorative Maintenance

Vehicle returned to local Mercury dealership with instructions to repair carburetor.

3rd Retest

Failure Modes:

- FTP - NO_x

Diagnostic Inspection Problem Areas

- Automatic Choke (Fast Idle Sticks)

4th Retest

No restorative maintenance was performed prior to this test. The retest was performed as a recheck of the NO_x which was marginally out of limit.

Failure Mode:

- None

Diagnostic Inspection Problem Area

- Automatic Choke (Fast Idle Sticks)

Comments

- No driveability problems were noted with this vehicle.
- Repair of the carburetor restored the emission levels to standards.
- Isolation of emission related defects with Rotunda Tester extremely time consuming.

EPA NO. 95206 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0560	0160	0690	F	08.6	02.5	07.9	F	0750	0800	P
1ST RETEST	0225	0165	0095	P	08.8	03.6	00.6	P	0950	0950	P
2ND RETEST	0825	0275	1050	F	08.8	03.4	09.3	F	0875	0875	P
3RD RETEST	0105	0095	0055	P	00.6	00.1	00.0	P	1000	1050	P
4TH RETEST	0040	0050	0040	P	00.0	00.0	00.0	P	1000	1000	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0790	0020	0060	09.4	02.8	00.9	0100	0370	0050	0070	0800
1ST RETEST	1240	0180	0940	10.1	02.6	09.9	0160	0630	0160	0830	0850
2ND RETEST	1010	0180	0850	09.4	02.9	09.0	0130	0490	0120	0900	0950
3RD RETEST	0310	0110	0050	01.2	01.7	00.0	0080	0520	0070	1010	0990
4TH RETEST	0020	0030	0060	00.0	00.0	00.0	0040	0240	0060	1000	1020

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	1369	0.0	0257	0150	0.0	0910	0.2	0035	0090	0.2
1ST RETEST	3099	2.2	0508	0250	2.2	9862	5.6	0029	0640	5.3
2ND RETEST	0885	0.0	0275	0100	0.0	8765	6.6	0038	0560	6.3
3RD RETEST	0277	0.0	0161	0040	0.0	0172	0.0	0063	0010	0.0
4TH RETEST	0341	0.0	0149	0040	0.0	0258	0.0	0044	0030	0.0

TABLE 5.1-6 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 95206 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

TEST	DATE	FTP RESULTS HC	CO	CO_2	NOX	NOXC	MPG	HFET RESULTS HC	CO	CO_2	NOX	MPG
INITIAL	7/16/79	003.07	050.49	0526.3	01.37	01.25	14.4	002.73	046.31	0368.6	01.23	19.71
1ST RETEST	9/7/79	003.78	067.92	0544.0	02.94	03.12	13.4	003.02	056.91	0356.4	02.81	19.47
2ND RETEST	9/27/79	002.72	049.70	0592.6	01.49	01.41	13.1	002.74	046.51	0367.9	01.19	19.72
3RD RETEST	10/8/79	000.74	003.28	0681.6	02.15	02.08	12.9	000.28	000.34	0454.1	01.29	19.47
4TH RETEST	10/8/79	000.88	005.13	0647.4	01.87	01.80	13.5	000.31	000.59	0441.0	01.20	20.02

FEDERAL 3 MODE TEST RESULTS

	HI (LAB) HC	CO	NOX	HI (GAR) HC	CO	LO (LAB) HC	CO	NOX	LO (GAR) HC	CO	IDLE (LAB) HC	CO	NOX	IDLE (GAR) HC	CO
INITIAL	3663	2.1	0307	0260	1.9	0662	0.0	0271	0050	0.0	0592	1.4	0030	0040	1.4
1ST RETEST	3610	2.1	1139	0240	2.1	0735	0.1	0364	0070	0.1	1087	0.9	0034	0090	0.8
2ND RETEST	3313	2.2	0442	0220	2.0	0612	0.0	0268	0070	0.0	7914	6.2	0040	0520	5.9
3RD RETEST	0124	0.0	0321	0010	0.0	0096	0.0	0297	0010	0.0	0206	0.0	0056	0010	0.0
4TH RETEST	0209	0.0	0316	0020	0.0	0185	0.0	0257	0020	0.0	0273	0.0	0182	0030	0.0

TABLE 5.1-6 (Sheet 2 of 2)

5.1.5.2.6 EPA NO 95209 - 1979 MERCURY MARQUIS

The test results for this vehicle are shown in Table 5.1-7.

Initial Test

Failure Modes:

- FTP - NO_x

Diagnostic Inspection Problem Areas:

- None

NOTE

Adequate diagnosis of this vehicle required the use of a Rotunda Electronic Engine Control System Tester. After obtaining the tester a new set of emissions tests were performed to establish a new baseline prior to performing any restorative maintenance.

1st Retest

Failure Modes:

- DEQ Idle Test - HC and CO
- FTP - NO_x

Diagnostic Inspection Problem Areas:

- EGR Valve Defective

1st Restorative Maintenance

Vehicle sent to local dealership for EGR Valve replacement.

2nd Retest

Failure Modes:

- FTP - NO_x

Diagnostic Inspection Problem Areas:

EGR Valve Defective (valve diaphragm leaks)

2nd Restorative Maintenance

Vehicle sent to local dealership for EGR Valve replacement.

3rd Retest

Failure Modes:

- None

Diagnostic Inspection Problem Areas:

- None

5.1.5.2.6 (Continued)

Comments

- No driveability problems were noted with this vehicle.
- The actual replacement of the EGR Valve during the first restorative maintenance is questionable.
- Replacement of the EGR Valve restored the emission levels to standards.

EPA NO. 95209 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0015	0010	0020	P	00.0	00.0	00.0	P	0750	0750	P
1ST RETEST	0295	0165	0335	F	02.0	01.1	01.3	F	0900	0900	P
2ND RETEST	0160	0040	0030	P	01.7	00.0	00.0	P	0850	0850	P
3RD RETEST	0025	0025	0025	P	00.1	00.3	00.0	P	0850	0850	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0020	0080	0030	00.0	01.9	00.0	0060	0070	0060	0750	0780
1ST RETEST	0280	0020	0010	00.3	00.0	00.0	0060	0120	0040	0760	0760
2ND RETEST	0170	0040	0020	02.0	00.8	00.0	0060	0100	0120	0900	0920
3RD RETEST	0050	0010	0010	00.0	00.0	00.0	0040	0080	0040	0750	0730

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0093	0.0	0238	0010	0.0	0167	0.0	0042	0010	0.0
1ST RETEST	0069	0.0	0311	0000	0.0	0057	0.0	0036	0000	0.0
2ND RETEST	0139	0.0	0339	0020	0.0	0124	0.0	0033	0020	0.0
3RD RETEST	0142	0.0	0264	0030	0.0	0179	0.0	0041	0030	0.0

TABLE 5.1-7 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 95209 MAKE/MODEL: Mercury Marquis ENG: 351-2V TRANS: Auto

TEST	DATE	FTP RESULTS HC	CO	CO_2	NOX	NOXC	MPG	HFET RESULTS HC	CO	CO_2	NOX	MPG
INITIAL	7/18/79	000.21	001.63	0613.0	02.31	02.67	14.4	000.35	010.73	0424.4	00.60	20.04
1ST RETEST	9/12/79	000.22	001.22	0570.7	02.16	02.05	15.5	000.04	000.04	0422.7	02.17	20.97
2ND RETEST	10/19/79	000.26	001.77	0570.6	02.80	02.53	15.4	000.05	000.05	0413.7	03.23	21.42
3RD RETEST	11/1/79	000.28	002.69	0586.5	01.33	01.18	15.0	000.07	000.01	0442.2	01.02	20.05

FEDERAL 3 MODE TEST RESULTS

	HI (LAB) HC	CO	NOX	HI (GAR) HC	CO	LO (LAB) HC	CO	NOX	LO (GAR) HC	CO	IDLE (LAB) HC	CO	NOX	IDLE (GAR) HC	CO
INITIAL	0154	0.0	0847	0030	0.0	0090	0.0	0152	0020	0.0	0145	0.0	0083	0020	0.0
1ST RETEST	0050	0.0	0920	0000	0.0	0026	0.0	0447	0000	0.0	0023	0.0	0052	0000	0.0
2ND RETEST	0066	0.0	1011	0020	0.0	0047	0.0	0528	0010	0.0	0044	0.0	0043	0010	0.0
3RD RETEST	0081	0.0	0381	0020	0.0	0047	0.0	0276	0020	0.0	0065	0.0	0034	0020	0.0

TABLE 5.1-7 (Sheet 2 of 2)

5.1.5.2.7 EPA NO. 95213 - 1979 MERCURY MARQUIS

The test results for this vehicle are shown in Table 5.1-8.

Initial Test

Failure Mode:

- FTP - NO_x (3.66 gpm)

Diagnostic Inspection Problem Area:

- Idle Speed High

NOTE

Adequate diagnosis of this vehicle required the use of a Rotunda Electronic Engine Control System Tester. After obtaining the tester a new set of emissions tests were performed to establish a new baseline prior to performing any restorative maintenance.

1st Retest

Failure Mode:

- FTP - NO_x (3.76 gpm)

Diagnostic Inspection Problem Areas:

- Automatic Choke (fast idle sticks)
- Catalytic Converters Suspect

1st Restorative Maintenance

Local dealership replaced Catalytic Converters

2nd Retest

Failure Mode:

- FTP - NO_x (2.58 gpm)

Diagnostic Inspection Problem Areas:

- Idle Speed High
- ECA Processor Calibration Unit suspect

2nd Restorative Maintenance

Replaced ECA Processor Calibration Unit.

3rd Retest

Failure Mode:

- FTP - NO_x (3.95 gpm)

Diagnostic Inspection Problem Area:

- EGR Valve Suspect

5.1.5.2.7 (Continued)

3rd Restorative Maintenance

Local dealership replaced EGR Valve

4th Retest

Failure Mode:

- FTP - NO_x (2.67 gpm)

Diagnostic Inspection Problem Areas

- Idle Speed High
- ECA Processor Suspect

4th Restorative Maintenance

Local dealership replaced ECA Processor

5th Retest

Failure Mode:

- FTP - NO_x (3.68 gpm)

Diagnostic Inspection Problem Area

- None

5th Restorative Maintenance

Two Ford Motor Company field representatives came to Portland to investigate the problem. Working at the local dealership using the dealer's test equipment (including the Rotunda Tester) the only problem isolated was a faulty thermostat which was replaced.

6th Retest

Failure Mode:

- FTP - NO_x (2.61 gpm)

Diagnostic Inspection Problem Area

- None

Comments

- No driveability problems were noted with this vehicle.
- Ford field representative's comment regarding results of 6th Retest was that there was no problem with the vehicle.

EPA NO. 95213 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0015	0020	0020	P	00.0	00.0	00.0	P	1000	1000	P
1ST RETEST	0020	0020	0020	P	00.0	00.1	00.0	P	0900	0900	P
2ND RETEST	0010	0015	0020	P	00.0	00.0	00.0	P	1000	1000	P
3RD RETEST	0015	0015	0015	P	00.5	00.0	00.0	P	0900	0900	P
4TH RETEST	0010	0015	0015	P	00.0	00.0	00.0	P	1000	0900	P
5TH RETEST	0015	0030	0015	P	00.0	00.0	00.0	P	1200	1200	F
6TH RETEST	0010	0020	0010	P	00.0	00.0	00.0	P	0800	0800	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0080	0020	0020	00.4	00.0	00.0	0040	0160	0060	0990	0950
1ST RETEST	0020	0010	0010	00.0	00.0	00.0	0080	0260	0080	0920	0940
2ND RETEST	0010	0010	0010	00.0	00.0	00.0	0050	0140	0040	1020	0980
3RD RETEST	0010	0010	0010	00.0	00.0	00.0	0130	0400	0070	0540	0910
4TH RETEST	0020	0020	0020	00.0	00.0	00.0	0090	0240	0050	0910	0940
5TH RETEST	0030	0020	0010	00.0	00.0	00.0	0080	0240	0050	0840	0770
6TH RETEST	0010	0010	0010	00.0	00.0	00.0	0030	0180	0030	0750	0740

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0068	0.0	0207	0020	0.0	0038	0.0	0115	0020	0.0
1ST RETEST	0167	0.1	0313	0010	0.0	0090	0.0	0060	0010	0.0
2ND RETEST	0108	0.0	0319	0040	0.0	0090	0.0	0204	0040	0.0
3RD RETEST	0069	0.0	0289	0010	0.0	0066	0.0	0143	0010	0.0
4TH RETEST	0069	0.0	0227	0020	0.0	0054	0.0	0045	0010	0.0
5TH RETEST	0151	0.0	0171	0040	0.0	0127	0.0	0116	0040	0.0
6TH RETEST	0127	0.0	0583	0020	0.0	0139	0.0	0120	0020	0.0

TABLE 5.1-8 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 95213 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

TEST	DATE	FTP RESULTS HC	CO	CO_2	NOX	NOXC	MPG	HFET RESULTS HC	CO	CO_2	NOX	MPG
INITIAL	7/23/79	000.23	001.46	0603.2	03.52	03.66	14.6	000.05	000.05	0429.4	01.90	20.64
1ST RETEST	9/20/79	000.29	002.02	0585.2	03.85	03.76	15.0	000.06	000.07	0403.5	02.63	21.96
2ND RETEST	10/24/79	000.19	001.43	0608.4	02.72	02.58	14.5	000.02	000.00	0434.2	02.27	20.42
3RD RETEST	10/29/79	000.29	002.22	0619.5	04.36	03.95	14.2	000.02	000.00	0415.9	01.55	21.32
4TH RETEST	11/30/79	000.29	002.49	0604.4	03.24	02.67	14.6	000.04	000.01	0426.2	01.73	20.80
5TH RETEST	01/1/80	000.30	002.74	0586.8	04.61	03.68	15.0	000.07	000.08	0415.5	01.52	21.32
6TH RETEST	2/4/80	000.35	003.24	0576.3	03.15	02.61	15.2	000.05	000.08	0410.2	01.57	21.60

FEDERAL 3 MODE TEST RESULTS

	HI (LAB) HC	CO	NOX	HI (GAR) HC	CO	LO (LAB) HC	CO	NOX	LO (GAR) HC	CO	IDLE (LAB) HC	CO	NOX	IDLE (GAR) HC	CO
INITIAL	0056	0.0	0328	0010	0.0	0035	0.0	0296	0010	0.0	0032	0.0	0554	0010	0.0
1ST RETEST	0057	0.0	0442	0000	0.0	0093	0.0	0789	0010	0.0	0075	0.0	0447	0010	0.0
2ND RETEST	0050	0.0	0419	0020	0.0	0029	0.0	0300	0020	0.0	0035	0.0	0092	0010	0.0
3RD RETEST	0026	0.0	0366	0000	0.0	0017	0.0	0335	0000	0.0	0032	0.0	0165	0000	0.0
4TH RETEST	0090	0.0	0256	0010	0.0	0050	0.0	0418	0020	0.0	0081	0.0	0471	0020	0.0
5TH RETEST	0130	0.0	0240	0040	0.0	0114	0.0	0190	0040	0.0	0154	0.0	0328	0040	0.0
6TH RETEST	0124	0.0	0267	0020	0.0	0090	0.0	0170	0020	0.0	0099	0.0	0180	0020	0.0

TABLE 5.1-8 (Sheet 2 of 2)

5.1.5.2.8 EPA NO 95214 - 1979 MERCURY MARQUIS

The test results for this vehicle are shown in Table 5.1-9.

Initial Test

Failure Mode:

- FTP - NO_X

Diagnostic Inspection Problem Areas

- Idle Speed High
- Automatic Choke (Fast Idle sticks)

NOTE

Adequate diagnosis of this vehicle required the use of a Rotunda Electronic Engine Control System Tester. After obtaining the tester a new set of emissions tests were performed to establish a new baseline prior to performing any restorative maintenance.

1st Retest

Failure mode:

- FTP - NO_X

Diagnostic Inspection Problem Areas

- Automatic Choke (fast idle sticks)
- Exhaust Oxygen Sensor disabled

1st Restorative Maintenance

- Reconnected Oxygen Sensor

Failure Mode:

- None

Diagnostic Inspection Problem Area

- Automatic Choke

Comments

- No driveability problems were noted with this vehicle.
- Reconnecting Oxygen Sensor restored emission levels to standards.

EPA NO. 95214 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

DEQ IDLE TEST

	----------HC-------				----------CO----------				------RPM-----		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0015	0010	0040	P	00.0	00.0	00.0	P	1150	1150	F
1ST RETEST	0010	0060	0020	P	00.0	00.2	00.0	P	0900	0900	P
2ND RETEST	0015	0020	0010	P	00.0	00.0	00.0	P	0900	0900	P

HTS IDLE TEST

	-------HC------			------CO------			------NOX------			---RPM---	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0010	0010	0010	00.0	00.0	00.0	0070	0120	0040	1110	1080
1ST RETEST	0010	0010	0010	00.0	00.0	00.0	0080	0230	0080	0740	0730
2ND RETEST	0010	0010	0010	00.0	00.0	00.0	0100	0190	0060	0680	0720

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0063	0.0	0238	0020	0.0	0026	0.0	0126	0010	0.0
1ST RETEST	0093	0.0	0907	0060	0.0	0047	0.0	0118	0040	0.0
2ND RETEST	0072	0.0	0123	0040	0.0	0068	0.0	0032	0040	0.0

TABLE 5.1-9 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 95214 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

TEST	DATE	FTP RESULTS HC	CO	CO_2	NOX	NOXC	MPG	HFET RESULTS HC	CO	CO_2	NOX	MPG
INITIAL	7/24/79	000.74	004.45	0642.2	05.89	05.59	13.6	000.04	000.00	0437.1	05.80	20.28
1ST RETEST	9/11/79	000.24	002.48	0574.7	05.18	04.88	15.3	000.05	000.01	0429.7	05.90	20.63
2ND RETEST	9/12/79	000.29	003.18	0575.9	01.36	01.33	15.2	000.04	000.00	0427.2	01.19	20.75

FEDERAL 3 MODE TEST RESULTS

	HI (LAB) HC	CO	NOX	HI (GAR) HC	CO	LO (LAB) HC	CO	NOX	LO (GAR) HC	CO	IDLE (LAB) HC	CO	NOX	IDLE (GAR) HC	CO
INITIAL	0044	0.0	1675	0020	0.0	0044	0.0	0804	0020	0.0	0023	0.0	0235	0010	0.0
1ST RETEST	0065	0.0	1837	0040	0.0	0053	0.0	0974	0040	0.0	0047	0.0	0352	0030	0.0
2ND RETEST	0065	0.0	0166	0030	0.0	0044	0.0	0163	0030	0.0	0035	0.0	0053	0020	0.0

TABLE 5.1-9 (Sheet 2 of 2)

5.1.5.3 Additional Retests

Two Mercury Marquises which passed the EPA criteria were recruited for an additional retest.

EPA NO. 95201 was recalled to aid in the isolation of the problem with the Mercury (EPA NO. 95213). The vehicle was retested and the results are shown in Table 5.1-10.

EPA NO. 95212 was retested to confirm the HFET miles per gallon (MPG) results. The retest results were similar and are shown in Table 5.1-11.

5.1.5.4 Lead Content Check

Fuel tank samples were taken prior to the initial test on each vehicle to analyze the Tetraethyl Lead content. The results in hundredths of a gram per gallon are shown in Table 5.1-1.

EPA NO. 95201 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0015	0025	0020	P	00.0	00.0	00.0	P	0800	0800	P
1ST RETEST	0030	0045	0015	P	00.3	00.1	00.0	P	1200	1300	F

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0020	0020	0010	00.0	00.0	00.0	0040	0080	0030	0080	0820
1ST RETEST	0050	0020	0120	00.4	00.3	02.6	0050	0100	0080	1630	1740

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0115	0.0	0092	0020	0.0	0069	0.0	0028	0000	0.0
1ST RETEST	0161	0.0	0127	0020	0.0	0066	0.0	0033	0000	0.0

TABLE 5.1-10 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 95201 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

TEST	DATE	FTP RESULTS HC	CO	CO_2	NOX	NOXC	MPG	HFET RESULTS HC	CO	CO_2	NOX	MPG
INITIAL	6/28/79	000.37	003.07	0603.1	00.87	00.83	14.6	000.05	000.02	0432.8	00.62	20.48
1ST RETEST	10/25/79	000.40	003.01	0604.0	01.01	00.92	14.5	000.06	000.06	0432.6	00.68	20.49

FEDERAL 3 MODE TEST RESULTS

	HI (LAB) HC	CO	NOX	HI (GAR) HC	CO	LO (LAB) HC	CO	NOX	LO (CAR) HC	CO	IDLE (LAB) HC	CO	NOX	IDLE (GAR) HC	CO
INITIAL	0225	0.0	0147	0020	0.0	0084	0.0	0109	0010	0.0	0054	0.0	0054	0000	0.0
1ST RETEST	0142	0.0	0122	0020	0.0	0069	0.0	0182	0010	0.0	0072	0.0	0026	0010	0.0

TABLE 5.1-10 (Sheet 2 of 2)

EPA NO. 95212 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

DEQ IDLE TEST

	HC				CO				RPM		
	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
INITIAL	0010	0020	0040	P	00.0	00.0	00.2	P	0850	0850	P
1ST RETEST	0020	0040	0020	P	00.0	00.1	00.0	P	0800	0800	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
INITIAL	0030	0020	0020	00.0	00.0	00.0	0030	0090	0040	0750	0740
1ST RETEST	0030	0030	0030	00.0	00.0	00.0	0060	0180	0040	0750	0790

TWO MODE TEST

	30MPH(LAB)			30MPH(GAR)		IDLE(LAB)			IDLE(GAR)	
	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
INITIAL	0127	0.0	0110	0020	0.0	0148	0.0	0018	0020	0.0
1ST RETEST	0172	0.0	0142	0020	0.0	0188	0.0	0034	0040	0.0

TABLE 5.1-11 (Sheet 1 of 2)

FTP, HFET AND F3M TEST RESULTS

EPA NO. 95212 MAKE/MODEL: Mercury/Marquis ENG: 351-2V TRANS: Auto

TEST	DATE	FTP RESULTS HC	CO	CO_2	NOX	NOXC	MPG	HFET RESULTS HC	CO	CO_2	NOX	MPG
INITIAL	7/20/79	000.35	002.31	0609.2	01.42	01.61	14.4	000.09	000.05	0510.9	01.30	17.34
1ST RETEST	8/32/79	000.49	001.94	0603.5	01.39	01.46	14.6	000.06	000.01	0491.0	02.01	18.05

FEDERAL 3 MODE TEST RESULTS

	HI (LAB) HC	CO	NOX	HI (GAR) HC	CO	LO (LAB) HC	CO	NOX	LO (CAR) HC	CO	IDLE (LAB) HC	CO	NOX	IDLE (GAR) HC	CO
INITIAL	0072	0.0	0432	0010	0.0	0047	0.0	0187	0010	0.0	0044	0.0	0044	0010	0.0
1ST RETEST	0160	0.0	0402	0030	0.0	0102	0.0	0151	0020	0.0	0197	0.0	0032	0030	0.0

TABLE 5.1-11 (Sheet 2 of 2)

APPENDIX A - TEST GROUP NO. 1 INITIAL TEST RESULTS

LEGEND

SHORT TESTS

CO	- Carbon Monoxide in Percent
RPM	- Engine Idle RPM
NOX	- Oxides of Nitrogen in ppm
1ST	- Initial Idle Test
2500	- High Idle Test
2ND	- Second Idle Test
S	- Pass/Fail Status (P = Pass, F = Fail)
30 MPH(LAB)	- 30 MPH Test using Laboratory Analyzers
30 MPH(GAR)	- 30 MPH Test using Garage Analyzers
HI (LAB)	- 52 MPH Test using Laboratory Analyzers
HI (GAR)	- 52 MPH Test using Garage Analyzers
LO (LAB)	- 25 MPH Test using Laboratory Analyzers
LO (GAR)	- 25 MPH Test using Garage Analyzers
IDLE (LAB)	- Idle Test using Laboratory Analyzers
IDLE (GAR)	- Idle Test using Garage Analyzers
HC	- Hydrocarbon Emissions in ppm Hexane (GAR); in ppm total hydrocarbons (LAB).

FTP AND HFET TESTS

HC	- Hydrocarbon Emissions in Grams per Mile
CO	- Carbon Monoxide Emissions in Grams per Mile
CO2	- Carbon Dioxide Emissions in Grams per Mile
NOX	- Oxides of Nitrogen (uncorrected) Emissions in Grams per Mile
NOXC	- Oxides of Nitrogen Emissions Corrected for Humidity in Grams per Mile
MPG	- Miles per Gallon Calculated by the Carbon Balance Method

APPENDIX A

CELL 827, 1978 PONTIAC SUNBIRD

DEQ IDLE TEST

	HC				CO				RPM		
EPA NO.	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
82701	045	030	105	P	0.5	0.0	2.0	P	1050	1100	P

HTS IDLE TEST

	HC			CO			NOX			RPM	
EPA NO.	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
82701	030	060	010	0.0	0.8	0.0	050	070	040	0920	1000

TWO MODE TEST

	HI (LAB)			HI (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
82701	0198	0.1	0064	0010	0.1	0036	0.0	0016	0000	0.0

APPENDIX A

FTP, HFET AND F3M TEST RESULTS

CELL 827, 1978 PONTIAC SUNBIRD

			FTP RESULTS						HFET RESULTS				
EPA NO.	DATE	ODOM	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
82701	08-02-79	27351	00.45	005.99	389.6	00.82	00.79	22.1	00.07	00.53	299.4	00.38	29.5

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (CAR)		LO (LAB)			LO (CAR)		IDLE (LAB)			IDLE (CAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
82701	0164	0.0	0100	0010	0.0	0158	0.1	0226	0000	0.1	0033	0.0	0023	0000	0.0

APPENDIX A

CELL 842, 1978 SAAB

DEQ IDLE TEST

	HC				CO				RPM		
EPA NO.	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
84201	015	015	015	P	0.1	0.0	0.0	P	1200	1200	P
84202	010	015	010	P	0.0	0.0	0.0	P	0900	0900	P
84203	015	015	015	P	0.0	0.0	0.0	P	1100	1050	P
84204	100	065	105	P	2.4	2.4	2.5	F	1300	1300	F
84205	010	020	020	P	0.0	0.0	0.0	P	1350	1400	F
84206	020	020	030	P	0.0	0.0	0.0	P	0900	0900	P
AVG.	028	025	033		0.4	0.4	0.4		1117	1117	

HTS IDLE TEST

	HC			CO			NOX			RPM	
EPA NO.	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
84201	010	000	000	0.0	0.0	0.0	040	040	030	1110	1120
84202	010	010	010	0.0	0.0	0.0	070	100	070	0900	0900
84203	010	010	010	0.0	0.0	0.0	030	045	030	0970	0950
84204	080	050	090	1.8	2.1	2.1	060	070	060	1160	1210
84205	020	020	020	0.2	0.2	0.1	040	040	040	1300	1230
84206	160	120	050	0.9	0.5	0.0	110	180	050	0900	0900
AVG.	048	035	030	0.5	0.5	0.4	058	079	047	1057	1052

TWO MODE TEST

	HI (LAB)			HI (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
84201	0045	0.0	0183	0020	0.0	0014	0.0	0012	0010	0.0
84202	0054	0.0	0038	0000	0.0	0005	0.0	0012	0000	0.0
84203	0033	0.0	0150	0000	0.0	0005	0.0	0016	0000	0.0
84204	0078	0.0	0396	0000	0.0	0033	0.0	0023	0000	0.0
84205	0136	0.0	0025	0020	0.0	0100	0.1	0013	0010	0.1
84206	0063	0.0	0360	0000	0.0	0020	0.0	0025	0000	0.0
AVG.	0068	0.0	0192	0007	0.0	0030	0.0	0017	0003	0.0

APPENDIX A

FTP, HFET AND F3M TEST RESULTS

CELL 842, 1978 SAAB

			FTP RESULTS						HFET RESULTS				
EPA NO.	DATE	ODOM	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
84201	07-30-79	17806	00.19	002.92	407.4	00.61	00.66	21.5	00.06	00.46	299.9	00.42	29.4
84202	08-01-79	10686	00.26	003.21	410.5	00.19	00.19	21.3	00.08	00.58	336.6	00.32	26.2
84203	08-01-79	5169	00.13	001.58	426.1	00.45	00.45	20.7	00.03	00.18	349.7	01.18	25.3
84204	08-02-79	6105	01.14	038.12	391.2	00.51	00.47	19.5	01.38	64.68	243.8	00.37	25.3
84205	08-08-79	10620	00.32	006.05	438.2	00.12	00.11	19.8	00.26	04.14	299.5	00.14	28.9
84206	08-07-79	8414	00.16	002.47	418.6	00.50	00.48	21.0	00.03	00.16	286.4	01.04	30.9
AVG.		9800	00.20	009.06	415.3	00.40	00.39	20.6	00.31	11.70	302.7	00.58	27.67

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (GAR)		LO (LAB)			LO (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
84201	0057	0.0	0816	0010	0.0	0146	0.1	0033	0020	0.1	0124	0.1	0012	0020	0.1
84202	0072	0.0	0587	0000	0.0	0189	0.1	0033	0010	0.1	0020	0.0	0028	0000	0.0
84203	0048	0.0	0969	0000	0.0	0033	0.0	0050	0000	0.0	0008	0.0	0014	0000	0.0
84204	2116	4.7	0148	0120	4.4	2425	4.5	0086	0140	4.2	2608	4.5	0035	0120	4.2
84205	0421	0.2	0096	0030	0.2	0402	0.2	0030	0030	0.2	0152	0.2	0013	0010	0.2
84206	0051	0.0	0782	0000	0.0	0078	0.0	0042	0010	0.0	0029	0.0	0013	0000	0.0
AVG.	0461	0.8	0566	0027	0.8	0546	0.8	0046	0035	0.8	0490	0.8	0019	0025	0.8

APPENDIX A

CELL 847, 1978 VOLVO 240

DEQ IDLE TEST

	HC				CO				RPM		
EPA NO.	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
84701	015	020	020	P	0.0	0.1	0.0	P	1000	1000	P
84702	035	025	025	P	0.1	0.1	0.0	P	0950	0950	P
84703	020	025	020	P	0.0	0.3	0.0	P	1150	1150	P
84704	055	045	045	P	0.1	0.0	0.0	P	1000	1000	P
84705	010	015	015	P	0.0	0.0	0.0	P	1000	1000	P
84706	100	030	065	P	0.1	0.0	0.0	P	0900	1000	P
84707	115	045	120	P	3.1	0.1	3.1	F	1000	1000	P
AVG.	050	029	044		0.5	0.1	0.4		1000	1014	

HTS IDLE TEST

	HC			CO			NOX			RPM	
EPA NO.	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
84701	015	010	010	0.0	0.0	0.0	030	070	030	0970	0950
84702	080	020	040	0.3	0.1	0.1	030	050	030	0860	0870
84703	010	010	010	0.0	0.0	0.0	020	040	030	0940	0950
84704	080	030	020	0.0	0.4	0.1	040	050	030	1010	1000
84705	010	010	010	0.0	0.0	0.0	030	050	030	0900	0900
84706	080	020	060	0.0	0.0	0.1	030	070	030	0840	0810
84707	150	040	170	3.0	0.0	3.0	060	040	060	0840	0850
AVG.	061	026	041	0.5	0.1	0.5	034	053	034	0909	0904

TWO MODE TEST

	HI (LAB)			HI (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
84701	0063	0.0	0265	0010	0.0	0161	0.0	0014	0010	0.0
84702	0118	0.0	0157	0020	0.0	0241	0.0	0009	0040	0.0
84703	0048	0.0	0013	0020	0.0	0032	0.0	0013	0020	0.0
84704	0042	0.0	0019	0010	0.0	0055	0.0	0012	0010	0.0
84705	0039	0.0	0195	0010	0.0	0008	0.0	0012	0010	0.0
84706	0078	0.0	0244	0020	0.0	0219	0.0	0013	0020	0.0
84707	0179	0.0	0362	0030	0.0	1268	2.5	0016	0090	2.3
AVG.	0081	0.0	0179	0017	0.0	0283	0.4	0013	0029	0.3

APPENDIX A

FTP, HFET AND F3M TEST RESULTS

CELL 847, 1978 VOLVO 240

			FTP RESULTS						HFET RESULTS				
EPA NO.	DATE	ODOM	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
84701	07-18-79	20230	00.24	003.21	498.2	01.44	01.45	17.6	00.03	00.14	341.4	01.77	25.9
84702	07-19-79	12516	00.30	003.42	492.6	00.57	00.65	17.8	00.09	00.76	383.7	00.32	23.0
84703	07-18-79	8211	00.33	001.94	478.9	00.28	00.32	18.4	00.02	00.17	366.6	00.23	24.1
84704	07-20-79	15585	00.36	004.70	477.5	00.28	00.28	18.2	00.07	00.79	326.5	00.07	27.0
84705	07-23-79	19805	00.25	003.99	509.4	00.97	00.95	17.2	00.13	02.40	378.8	00.20	23.1
84706	07-23-79	11860	00.27	002.70	458.3	00.60	00.59	19.1	00.03	00.08	315.9	01.00	28.0
84707	07-25-79	13686	00.70	016.82	445.5	00.93	00.97	18.7	00.05	00.53	365.9	01.03	24.1
AVG.		14556	00.35	005.25	480.1	00.72	00.74	18.1	00.06	00.70	354.1	00.66	25.0

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (GAR)		LO (LAB)			LO (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
84701	0066	0.0	0971	0010	0.0	0051	0.0	0210	0005	0.0	0574	0.1	0014	0060	0.1
84702	0121	0.0	0389	0020	0.0	0115	0.0	0033	0020	0.0	0290	0.1	0009	0030	0.1
84703	0032	0.0	0421	0020	0.0	0152	0.1	0020	0020	0.1	0078	0.1	0013	0020	0.0
84704	0051	0.0	0203	0010	0.0	0112	0.1	0012	0020	0.1	0641	0.2	0012	0080	0.2
84705	0045	0.0	0976	0020	0.0	0051	0.0	0019	0020	0.0	0060	0.0	0012	0020	0.0
84706	0087	0.0	0687	0020	0.0	0066	0.0	0113	0020	0.0	0607	0.1	0013	0080	0.1
84707	0134	0.0	0804	0020	0.0	0100	0.0	0128	0020	0.0	1085	2.4	0019	0080	2.5
AVG.	0077	0.0	0636	0017	0.0	0092	0.0	0076	0018	0.0	0476	0.4	0013	0053	0.4

APPENDIX A

CELL 848, 1978 VOLVO 260

DEQ IDLE TEST

EPA NO.	HC 1ST	HC 2500	HC 2ND	HC S	CO 1ST	CO 2500	CO 2ND	CO S	RPM 1ST	RPM 2ND	RPM S
84801	015	020	015	P	0.0	0.0	0.0	P	1150	1150	F
84802	020	015	025	P	0.0	0.0	0.0	P	1250	1300	F
84803	025	025	020	P	0.1	0.1	0.1	P	0950	0950	P
84804	015	020	020	P	0.0	0.0	0.0	P	0900	0900	P
84805	015	025	020	P	0.0	0.1	0.0	P	0900	0900	P
84806	030	115	025	P	0.0	4.5	0.0	P	0800	1000	P
AVG.	020	037	021		0.0	0.8	0.0		0992	1033	

HTS IDLE TEST

EPA NO.	HC 1ST	HC 2500	HC 2ND	CO 1ST	CO 2500	CO 2ND	NOX 1ST	NOX 2500	NOX 2ND	RPM 1ST	RPM 2ND
84801	010	010	010	0.0	0.0	0.0	050	080	040	0940	0970
84802	030	020	020	0.0	0.0	0.0	060	130	060	0940	0980
84803	010	000	010	0.0	0.0	0.0	040	040	040	0880	0870
84804	020	010	020	0.0	0.0	0.0	040	080	040	0800	0820
84805	030	020	060	0.0	0.0	0.0	070	240	030	0880	0780
84806	010	020	010	0.0	0.0	0.0	040	020	020	0900	0900
AVG.	018	013	022	0.0	0.0	0.0	050	098	038	0898	0887

TWO MODE TEST

EPA NO.	HI (LAB) HC	HI (LAB) CO	HI (LAB) NOX	HI (GAR) HC	HI (GAR) CO	IDLE (LAB) HC	IDLE (LAB) CO	IDLE (LAB) NOX	IDLE (GAR) HC	IDLE (GAR) CO
84801	0051	0.0	0253	0020	0.0	0042	0.0	0033	0020	0.0
84802	0118	0.0	0195	0020	0.0	0094	0.0	0038	0000	0.0
84803	0308	0.1	0012	0030	0.1	0155	0.0	0012	0020	0.1
84804	0057	0.0	0124	0020	0.0	0060	0.0	0021	0020	0.0
84805	0093	0.0	0147	0010	0.0	0054	0.0	0013	0010	0.0
84806	0048	0.0	0081	0000	0.0	0038	0.0	0016	0000	0.0
AVG.	0113	0.0	0135	0017	0.0	0074	0.0	0022	0012	0.0

APPENDIX A

FTP, HFET AND F3M TEST RESULTS

CELL 848, 1978 VOLVO 260

			FTP RESULTS						HFET RESULTS				
EPA NO.	DATE	ODOM	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
84801	07-25-79	16501	00.32	004.34	639.1	01.03	00.98	13.7	00.05	01.06	399.4	01.03	22.1
84802	07-26-79	23128	00.55	004.48	565.0	00.98	01.02	15.5	00.17	01.17	409.4	01.07	21.5
84803	07-26-79	10148	00.46	006.23	528.9	00.54	00.52	16.4	00.08	00.64	401.1	00.76	22.0
84804	07-27-79	11337	00.33	005.01	582.5	00.89	00.84	15.0	00.06	00.71	379.5	00.41	23.2
84805	08-01-79	24000	00.53	004.91	570.1	01.04	01.05	15.3	00.04	00.57	332.6	00.45	26.5
84806	08-01-79	10772	00.30	003.79	549.8	00.68	00.65	15.9	00.03	00.67	404.5	00.37	21.8
AVG.		15981	00.42	004.79	572.6	00.86	00.84	15.3	00.07	00.80	387.8	00.68	22.9

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (GAR)		LO (LAB)			LO (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
84801	0082	0.0	0499	0020	0.1	0030	0.0	0126	0010	0.0	0030	0.0	0026	0010	0.0
84802	0247	0.1	0537	0020	0.1	0097	0.0	0205	0000	0.0	0066	0.0	0059	0000	0.0
84803	0103	0.0	0107	0010	0.0	0268	0.1	0071	0020	0.1	0106	0.1	0012	0000	0.1
84804	0118	0.0	0274	0030	0.0	0060	0.0	0023	0020	0.0	0033	0.0	0014	0010	0.0
84805	0149	0.0	0600	0010	0.0	0057	0.0	0091	0000	0.0	0057	0.0	0013	0000	0.0
84806	0066	0.0	0268	0000	0.0	0029	0.0	0018	0000	0.0	0023	0.0	0013	0000	0.0
AVG.	0128	0.0	0381	0015	0.0	0090	0.0	0089	0008	0.0	0053	0.0	0023	0003	0.0

APPENDIX A

CELL 942, 1979 SAAB

DEQ IDLE TEST

	HC				CO				RPM		
EPA NO.	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
94201	010	010	010	P	0.0	0.0	0.0	P	1200	1500	P
94202	015	015	015	P	0.0	0.0	0.0	P	1100	1100	P
94203	060	055	055	P	0.0	0.2	0.1	P	1100	1100	P
AVG.	028	027	027		0.0	0.1	0.0		1133	1233	

HTS IDLE TEST

	HC			CO			NOX			RPM	
EPA NO.	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
94201	020	020	010	0.0	0.0	0.0	060	040	040	1200	1180
94202	010	010	010	0.0	0.0	0.0	040	040	040	1100	1100
94203	010	020	020	0.0	0.0	0.0	020	040	040	1130	1140
AVG.	013	017	013	0.0	0.0	0.0	040	040	040	1143	1140

TWO MODE TEST

	HI (LAB)			HI (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
94201	0026	0.0	0114	0000	0.0	0002	0.0	0016	0000	0.0
94202	0066	0.0	0549	0000	0.0	0023	0.0	0031	0000	0.0
94203	0069	0.0	0081	0000	0.0	0020	0.0	0019	0000	0.0
AVG.	0054	0.0	0246	0000	0.0	0015	0.0	0020	0000	0.0

APPENDIX A

FTP, HFET AND F3M TEST RESULTS

CELL 942, 1979 SAAB

			FTP RESULTS						HFET RESULTS				
EPA NO.	DATE	ODOM	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
94201	08-01-79	11382	00.13	001.92	426.8	00.71	00.68	20.6	00.02	00.11	296.3	01.53	29.9
94202	08-02-79	4032	00.10	001.71	449.9	00.48	00.45	19.6	00.03	00.28	294.2	00.38	30.0
94203	08-03-79	5302	00.20	003.37	415.7	00.35	00.32	21.0	00.17	02.64	295.4	00.25	29.5
AVG.		6905	00.14	002.33	430.8	00.52	00.48	20.4	00.07	01.01	295.3	00.72	29.8

FEDERAL 3 MODE TEST RESULTS

	---HI (LAB)---			-HI (GAR)-		---LO (LAB)---			-LO (GAR)-		--IDLE (LAB)--			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
94201	0054	0.0	1150	0000	0.0	0036	0.0	0040	0000	0.0	0005	0.0	0023	0000	0.0
94202	0039	0.0	0475	0000	0.0	0060	0.0	0031	0000	0.0	0011	0.0	0028	0000	0.0
94203	0238	0.1	0119	0020	0.1	0146	0.1	0066	0010	0.1	0030	0.0	0021	0000	0.0
AVG.	0110	0.0	0581	0007	0.0	0081	0.0	0046	0003	0.0	0015	0.0	0024	0000	0.0

APPENDIX A

CELL 947, 1979 VOLVO 240

DEQ IDLE TEST

	HC				CO				RPM		
EPA NO.	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
94701	030	050	035	P	0.0	0.5	0.0	P	0975	0975	P
94702	020	015	025	P	0.0	0.0	0.0	P	1200	1200	P
94703	100	055	120	P	1.3	0.2	1.6	F	0850	0850	P
94704	015	085	025	P	0.0	2.4	0.0	P	1000	1000	P
94705	010	015	015	P	0.0	0.0	0.0	P	1050	1050	P
94706	095	120	105	P	3.2	4.9	2.9	F	0950	0950	P
94707	015	020	020	P	0.0	0.0	0.0	P	0950	0950	P
94708	010	015	015	P	0.0	0.0	0.0	P	0900	0900	P
AVG.	040	053	050		0.8	1.3	0.8		0950	0950	

HTS IDLE TEST

	HC			CO			NOX			RPM	
EPA NO.	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
94701	090	030	040	0.5	0.2	0.1	040	145	040	0840	0860
94702	010	010	010	0.0	0.0	0.0	020	060	030	0930	0950
94703	180	030	170	1.5	0.0	1.3	050	040	050	0750	0760
94704	060	020	030	0.2	0.0	0.1	030	110	020	0940	0950
94705	020	010	010	0.0	0.0	0.0	030	070	050	0910	0960
94706	130	120	150	1.8	5.2	1.6	060	100	070	0990	0980
94707	140	050	060	0.8	0.3	0.0	050	140	050	0850	0870
94708	020	020	010	0.0	0.0	0.0	030	060	050	0880	0880
AVG.	092	042	072	0.7	0.9	0.5	042	087	048	0887	0900

TWO MODE TEST

	HI (LAB)			HI (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
94701	0063	0.0	0255	0000	0.0	0026	0.0	0011	0000	0.0
94702	0026	0.0	0078	0010	0.0	0008	0.0	0011	0010	0.0
94703	0145	0.0	0269	0010	0.0	0525	0.4	0011	0040	0.4
94704	0029	0.0	0011	0000	0.0	0029	0.0	0011	0000	0.0
94705	0062	0.0	0231	0020	0.0	0041	0.0	0015	0010	0.0
94706	2076	1.7	0039	0130	1.8	2235	2.3	0037	0120	2.3
94707	0084	0.0	0449	0020	0.0	0078	0.0	0037	0020	0.0
94708	0023	0.0	0158	0010	0.0	0023	0.0	0022	0010	0.0
AVG.	0314	0.2	0186	0025	0.2	0371	0.3	0019	0026	0.3

APPENDIX A

FTP, HFET AND F3M TEST RESULTS

CELL 947, 1979 VOLVO 240

			FTP RESULTS						HFET RESULTS				
EPA NO.	DATE	ODOM	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
94701	07-17-79	13892	00.22	002.73	477.4	00.86	00.89	18.4	00.02	00.20	334.9	01.00	26.4
94702	07-17-79	4493	00.18	002.34	468.5	00.50	00.53	18.8	00.03	00.26	369.9	00.14	23.9
94703	07-18-79	7530	00.38	004.48	467.2	00.96	01.12	18.7	00.04	00.15	346.6	01.55	25.5
94704	07-18-79	368	00.31	004.97	466.3	00.50	00.54	18.7	00.07	00.49	371.7	00.06	23.8
94705	07-19-79	9828	00.52	007.51	480.8	00.57	00.57	17.9	00.07	00.75	337.3	00.09	26.1
94706	07-19-79	12402	01.73	048.00	408.5	00.20	00.21	18.1	01.11	31.59	293.8	00.30	25.5
94707	07-23-79	15453	00.25	003.11	491.3	01.66	01.55	17.8	00.02	00.04	335.8	02.04	26.4
94708	07-23-79	3799	00.19	002.41	446.8	00.30	00.28	19.7	00.10	00.91	352.0	00.03	25.0
AVG.		8471	00.47	009.44	463.4	00.69	00.71	18.6	00.18	04.30	346.1	00.65	25.3

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (GAR)		LO (LAB)			LO (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
94701	0060	0.0	0575	0000	0.0	0050	0.0	0059	0000	0.0	0029	0.0	0011	0000	0.0
94702	0060	0.0	0617	0010	0.0	0014	0.0	0028	0000	0.0	0023	0.0	0011	0000	0.0
94703	0148	0.0	0854	0010	0.0	0084	0.0	0176	0010	0.0	0953	0.8	0011	0080	0.8
94704	0041	0.0	0536	0000	0.0	0047	0.0	0030	0000	0.0	0335	0.5	0009	0020	0.5
94705	0072	0.0	0316	0010	0.0	0041	0.0	0018	0010	0.0	0023	0.0	0013	0010	0.0
94706	1776	1.3	0085	0120	1.3	1923	1.8	0061	0120	1.7	2069	2.6	0049	0110	2.3
94707	0078	0.0	1029	0020	0.0	0041	0.0	0367	0020	0.0	0050	0.0	0037	0010	0.0
94708	0056	0.0	0044	0010	0.0	0087	0.0	0013	0010	0.0	0016	0.0	0013	0000	0.0
AVG.	0286	0.2	0507	0023	0.2	0286	0.2	0094	0021	0.2	0437	0.5	0019	0029	0.5

APPENDIX A

CELL 948, 1979 VOLVO 260

DEQ IDLE TEST

	HC				CO				RPM		
EPA NO.	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
94801	010	050	010	P	0.0	0.0	0.0	P	0950	0900	P
94802	025	020	020	P	0.0	0.0	0.0	P	1550	1550	F
94803	010	010	015	P	0.0	0.0	0.0	P	0900	0900	P
94804	010	015	015	P	0.0	0.0	0.0	P	1000	1000	P
94805	020	020	020	P	0.0	0.0	0.0	P	1100	1100	P
AVG.	015	023	016		0.0	0.0	0.0		1100	1090	

HTS IDLE TEST

	HC			CO			NOX			RPM	
EPA NO.	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
94801	010	010	010	0.0	0.0	0.0	060	050	050	0930	0930
94802	010	010	010	0.0	0.0	0.0	060	100	060	1200	1420
94803	010	000	010	0.0	0.0	0.0	060	080	050	0890	0900
94804	010	010	010	0.0	0.0	0.0	040	040	030	0950	0930
94805	020	020	020	0.0	0.0	0.0	040	100	050	0940	0940
AVG.	012	010	012	0.0	0.0	0.0	052	074	048	0982	1024

TWO MODE TEST

	HI (LAB)			HI (GAR)		IDLE(LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
94801	0057	0.0	0019	0020	0.0	0011	0.0	0012	0010	0.0
94802	0078	0.0	0207	0000	0.0	0057	0.0	0033	0000	0.0
94803	0186	0.1	0012	0030	0.1	0033	0.0	0014	0020	0.0
94804	0033	0.0	0021	0020	0.0	0030	0.0	0012	0020	0.0
94805	0011	0.0	0093	0020	0.0	0023	0.0	0031	0020	0.0
AVG.	0073	0.0	0070	0018	0.0	0031	0.0	0020	0014	0.0

APPENDIX A

FTP, HFET AND F3M TEST RESULTS

CELL 948, 1979 VOLVO 260

			FTP RESULTS						HFET RESULTS				
EPA NO.	DATE	ODOM	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
94801	07-25-79	6474	00.30	003.60	546.0	00.64	00.61	16.0	00.04	00.52	421.6	00.22	20.9
94802	07-26-79	2154	00.31	002.81	544.3	00.69	00.67	16.1	00.02	00.15	412.2	00.24	21.5
94803	07-27-79	9734	00.31	003.91	530.9	00.42	00.40	16.5	00.03	00.49	394.9	00.23	22.4
94804	07-30-79	5376	00.28	003.84	589.5	00.29	00.29	14.9	00.12	01.07	340.1	00.09	25.9
94805	07-31-79	2993	00.33	004.29	553.9	00.53	00.54	15.8	00.02	00.50	412.6	00.22	21.4
AVG.		5346	00.51	003.69	552.9	00.51	00.50	15.9	00.05	00.55	396.3	00.20	22.4

FEDERAL 3 MODE TEST RESULTS

	HI (LAB)			HI (GAR)		LO (LAB)			LO (GAR)		IDLE (LAB)			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
94801	0054	0.0	0066	0020	0.0	0060	0.0	0035	0020	0.0	0026	0.0	0031	0010	0.0
94802	0051	0.0	0362	0000	0.0	0030	0.0	0281	0000	0.0	0030	0.0	0059	0000	0.0
94803	0078	0.1	0054	0020	0.1	0063	0.0	0028	0020	0.0	0026	0.0	0033	0010	0.0
94804	0033	0.0	0064	0010	0.0	0085	0.0	0016	0020	0.0	0033	0.0	0012	0020	0.0
94805	0023	0.0	0150	0010	0.0	0023	0.0	0183	0020	0.0	0008	0.0	0045	0010	0.0
AVG.	0048	0.0	0139	0012	0.0	0052	0.0	0109	0016	0.0	0025	0.0	0036	0010	0.0

APPENDIX A

CELL 952, 1979 MERCURY MARQUIS

DEQ IDLE TEST

	---------HC---------				---------CO---------				-----RPM-----		
EPA NO.	1ST	2500	2ND	S	1ST	2500	2ND	S	1ST	2ND	S
95201	015	025	020	P	0.0	0.0	0.0	P	0800	0800	P
95202	020	030	020	P	0.0	0.0	0.0	P	1000	1000	P
95203	015	020	025	P	0.0	0.0	0.0	P	0650	0650	P
95204	015	025	015	P	0.0	0.0	0.0	P	0950	1000	P
95205	015	015	015	P	0.0	0.0	0.0	P	0950	1000	P
95206	560	160	690	F	8.6	2.5	7.9	F	0750	0800	P
95207	010	015	045	P	0.0	0.0	0.0	P	0750	0850	P
95208	015	020	025	P	0.0	0.0	0.0	P	0800	0800	P
95209	015	010	020	P	0.0	0.0	0.0	P	0750	0750	P
95210	025	070	030	P	0.0	1.4	0.0	P	0700	0700	P
95211	015	015	020	P	0.0	0.0	0.0	P	0850	0850	P
95212	010	020	040	P	0.0	0.0	0.2	P	0850	0850	P
95213	015	020	020	P	0.0	0.0	0.0	P	1000	1000	P
95214	015	010	040	P	0.0	0.0	0.0	P	1150	1150	F
95215	020	030	020	P	0.0	0.0	0.0	P	0900	0900	P
AVG.	052	032	070		0.6	0.3	0.5		0857	0873	

HTS IDLE TEST

	-------HC-------			-------CO-------			-------NOX-------			---RPM---	
EPA NO.	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
95201	020	020	010	0.0	0.0	0.0	040	080	030	0800	0820
95202	020	020	020	0.0	0.0	0.0	030	130	030	0950	0930
95203	020	020	030	0.0	0.0	0.0	040	150	030	0690	0700
95204	010	020	010	0.0	0.0	0.0	040	140	030	0920	0990
95205	020	020	020	0.0	0.0	0.0	030	240	060	0940	0950
95206	790	200	060	9.4	2.8	0.9	100	370	050	0700	0800
95207	050	030	020	0.0	0.0	0.0	050	220	050	0770	0790
95208	050	040	020	0.0	0.0	0.0	060	120	040	0840	0830
95209	020	080	030	0.0	1.9	0.0	060	070	060	0750	0780
95210	010	010	030	0.0	0.0	0.0	070	160	040	0720	0740
95211	010	010	020	0.0	0.0	0.0	030	120	030	0840	0840
95212	030	020	020	0.0	0.0	0.0	030	090	040	0750	0740
95213	080	020	020	0.4	0.0	0.0	040	160	060	0990	0950
95214	010	010	010	0.0	0.0	0.0	070	120	040	1110	1080
95215	030	020	010	0.0	0.0	0.0	080	060	040	0940	0870
AVG.	078	036	022	0.7	0.3	0.1	051	149	042	0847	0854

APPENDIX A

CELL 952, 1979 MERCURY MARQUIS

TWO MODE TEST

	----HI (LAB)----			HI (GAR)		---IDLE(LAB)-----			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
95201	0115	0.0	0093	0020	0.0	0069	0.0	0028	0000	0.0
95202	0030	0.0	0210	0010	0.0	0033	0.0	0040	0000	0.0
95203	0036	0.0	0205	0000	0.0	0057	0.0	0028	0000	0.0
95204	0039	0.0	0193	0010	0.0	0036	0.0	0035	0010	0.0
95205	0014	0.0	0243	0000	0.0	0023	0.0	0033	0000	0.0
95206	1369	0.0	0257	0150	0.0	0910	0.2	0035	0090	0.2
95207	0201	0.0	0174	0040	0.0	0143	0.0	0033	0020	0.0
95208	0155	0.0	0226	0030	0.0	0149	0.0	0040	0020	0.0
95209	0094	0.0	0238	0010	0.0	0167	0.0	0043	0010	0.0
95210	0051	0.0	0174	0020	0.0	0100	0.0	0026	0020	0.0
95211	0057	0.0	0243	0020	0.0	0072	0.0	0033	0020	0.0
95212	0127	0.0	0110	0020	0.0	0149	0.0	0018	0020	0.0
95213	0069	0.0	0207	0020	0.0	0038	0.0	0115	0020	0.0
95214	0063	0.0	0238	0020	0.0	0026	0.0	0126	0010	0.0
95215	0057	0.0	0154	0010	0.0	0084	0.0	0030	0010	0.0
AVG.	0165	0.0	0198	0025	0.0	0135	0.0	0044	0017	0.0

APPENDIX A

CELL 952, 1979 MERCURY MARQUIS

AIR PUMP FLOW DIVERTED TESTS

HTS IDLE TEST

	-------HC-------			-------CO-------			-------NOX------			---RPM---	
EPA NO.	1ST	2500	2ND	1ST	2500	2ND	1ST	2500	2ND	1ST	2ND
95201	520	170	510	4.1	4.9	4.0	050	090	060	0880	0850
95202	030	020	020	0.0	0.0	0.0	050	280	050	0880	0920
95203	050	030	050	0.0	0.0	0.0	030	270	040	0680	0690
95204	020	010	010	0.0	0.0	0.0	040	260	050	0780	0970
95205	230	080	020	0.9	1.5	0.0	040	060	020	0930	0900
95206	1150	260	950	9.9	4.1	9.8	130	360	110	0690	0790
95207	420	190	430	4.3	4.9	4.7	070	180	080	0850	0860
95208	630	200	500	7.9	5.8	6.0	100	160	110	0850	0900
95209	680	170	740	6.9	5.1	7.8	090	110	100	0810	0810
95210	490	190	490	4.4	4.3	3.6	100	120	090	0810	0830
95211	430	020	040	3.3	0.0	0.2	070	200	040	0890	0840
95212	120	060	110	0.2	1.3	0.4	040	120	050	0770	0750
95213	160	120	230	1.0	3.7	2.3	060	190	080	1000	1040
95214	150	080	180	1.1	2.4	1.4	050	120	080	1030	1040
95215	020	010	010	0.0	0.0	0.0	050	060	040	0810	0810
AVG.	340	107	286	2.9	2.5	2.7	065	172	067	0844	0867

TWO MODE TEST

	----HI (LAB)----			-HI (GAR)-		---IDLE (LAB)----			-IDLE (GAR)-	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
95201	3174	5.9	0033	0220	5.5	6845	5.5	0014	0500	5.1
95202	0033	0.0	0224	0000	0.0	0075	0.0	0045	0010	0.0
95203	0369	0.0	0224	0025	0.0	0311	0.0	0026	0010	0.0
95204	0042	0.0	0176	0010	0.0	0054	0.0	0050	0010	0.0
95205	0017	0.0	0219	0000	0.0	0051	0.0	0035	0000	0.0
95206	4094	3.0	0542	0300	3.0	9996	7.5	0033	0760	7.4
95207	2764	4.6	0062	0200	4.2	5074	4.1	0016	0360	3.9
95208	2994	3.2	0312	0210	3.1	5804	4.5	0033	0410	4.6
95209	2232	3.2	0035	0170	3.1	6304	4.7	0026	0450	4.3
95210	1709	1.8	0062	0120	1.6	3854	1.6	0021	0260	1.5
95211	2094	1.9	0143	0150	1.8	4124	2.7	0028	0280	2.5
95212	0155	0.0	0200	0020	0.0	0399	0.0	0023	0040	0.0
95213	0051	0.0	0285	0010	0.0	0124	0.0	0071	0020	0.0
95214	0057	0.0	0475	0020	0.0	0672	0.3	0031	0070	0.3
95215	0054	0.0	0139	0020	0.0	0118	0.0	0037	0020	0.0
AVG.	1323	1.6	0205	0098	1.5	2920	2.1	0033	1213	2.0

APPENDIX A

FEDERAL 3 MODE TEST RESULTS

CELL 952, 1979 MERCURY MARQUIS

	---HI (LAB)---			-HI (GAR)-		---LO (LAB)---			-LO (GAR)-		--IDLE (LAB)---			IDLE (GAR)	
EPA NO.	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO	HC	CO	NOX	HC	CO
95201	0225	0.0	0148	0020	0.0	0085	0.0	0109	0010	0.0	0054	0.0	0054	0000	0.0
95202	0039	0.0	0250	0010	0.0	0023	0.0	0267	0010	0.0	0023	0.0	0138	0000	0.0
95203	0063	0.0	0212	0000	0.0	0036	0.0	0255	0000	0.0	0066	0.0	0035	0000	0.0
95204	0033	0.0	0286	0005	0.0	0030	0.0	0243	0005	0.0	0026	0.0	0088	0000	0.0
95205	0033	0.0	0267	0000	0.0	0020	0.0	0269	0000	0.0	0008	0.0	0059	0000	0.0
95206	3664	2.1	0308	0260	1.9	0663	0.0	0272	0050	0.0	0593	1.4	0031	0040	1.4
95207	0097	0.0	0355	0020	0.0	0069	0.0	0131	0020	0.0	0106	0.0	0028	0020	0.0
95208	0308	0.0	0274	0040	0.0	0182	0.0	0296	0020	0.0	0216	0.0	0095	0030	0.0
95209	0155	0.0	0847	0030	0.0	0091	0.0	0152	0020	0.0	0146	0.0	0083	0020	0.0
95210	0137	0.0	0427	0020	0.0	0078	0.0	0475	0020	0.0	0085	0.0	0274	0020	0.0
95211	0066	0.0	0355	0010	0.0	0060	0.0	0284	0010	0.0	0063	0.0	0074	0010	0.0
95212	0072	0.0	0433	0010	0.0	0048	0.0	0188	0010	0.0	0044	0.0	0045	0010	0.0
95213	0057	0.0	0328	0010	0.0	0035	0.0	0297	0010	0.0	0032	0.0	0554	0010	0.0
95214	0045	0.0	1676	0020	0.0	0045	0.0	0804	0020	0.0	0023	0.0	0236	0010	0.0
95215	0038	0.0	0309	0010	0.0	0029	0.0	0205	0010	0.0	0026	0.0	0108	0010	0.0
AVG.	0335	0.1	0432	0031	0.1	0100	0.0	0283	0014	0.0	0101	0.1	0127	0012	0.1

APPENDIX A

FTP AND HFET TEST RESULTS

CELL 952, 1979 MERCURY MARQUIS

			FTP RESULTS						HFET RESULTS				
EPA NO.	DATE	ODOM	HC	CO	CO_2	NOX	NOXC	MPG	HC	CO	CO_2	NOX	MPG
95201	06-28-79	391	00.37	003.07	603.1	00.87	00.83	14.6	00.05	00.02	432.8	00.62	20.4
95202	07-11-79	10049	00.26	000.96	599.9	01.47	01.39	14.7	00.04	00.03	411.6	01.45	21.5
95203	07-11-79	8540	00.32	001.72	584.2	01.64	01.56	15.1	00.05	00.01	419.8	01.02	21.1
95204	07-12-79	9813	00.40	004.18	619.2	01.43	01.33	14.1	00.04	00.01	421.2	01.52	21.0
95205	07-12-79	9417	00.26	001.92	580.5	01.50	01.38	15.2	00.03	00.01	416.1	01.27	21.3
95206	07-12-79	7856	03.07	050.49	526.3	01.37	01.25	14.4	02.73	46.31	368.6	01.23	19.7
95207	07-13-79	9291	00.36	002.63	571.6	01.62	01.53	15.4	00.06	00.01	415.5	01.52	21.3
95208	07-13-79	3028	00.51	003.74	620.9	01.47	01.38	14.1	00.11	00.05	488.2	01.22	18.1
95209	07-17-79	4232	00.21	001.63	613.0	02.31	02.67	14.4	00.35	10.73	424.4	00.60	20.0
95210	07-19-79	7884	00.27	001.27	506.3	01.32	01.32	17.4	00.05	00.01	402.0	02.20	22.0
95211	07-19-79	10412	00.22	001.42	566.4	01.77	01.88	15.6	00.04	00.02	403.3	01.84	21.9
95212	07-20-79	13644	00.35	002.31	609.2	01.42	01.61	14.4	00.09	00.05	510.9	01.30	17.3
95213	07-20-79	10337	00.23	001.46	603.2	03.52	03.66	14.6	00.05	00.05	429.4	01.90	20.6
95214	07-23-79	3471	00.74	004.45	642.2	05.89	05.59	13.6	00.04	00.00	437.1	05.80	20.2
95215	08-07-79	9720	00.23	001.73	583.5	01.24	01.18	15.1	00.05	00.05	419.7	01.33	21.1
AVG.		7872	00.52	005.53	588.6	01.92	01.90	14.8	00.25	03.82	426.7	01.65	20.5